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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/912,652	07/24/2001	Vladimir Segal	30-5004 DIV2	6609

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EXAMINER

WILKINS III, HARRY D

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 12/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Applicati n No.	Applicant(s)	
	09/912,652	SEGAL ET AL.	
	Examiner	Art Unit	
	Harry D Wilkins, III	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 October 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 37-53 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 37-53 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>10222003</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The rejection grounds based on "Nickel, Cobalt and Their Alloys" have been withdrawn in view of Applicant's remarks regarding the publication date thereof.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 37-40, 42, 43, 46, 47, 50 and 51 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by "Development of a submicrometer-grained microstructure in aluminum 6061 using equal channel angular extrusion" (*Development*, henceforth).

Development anticipates the invention as claimed. *Development* teaches (see second section "Materials and Experimental Procedures") starting with aluminum alloy billets. Billets are ingots that have been subjected to deformation, and ingots are the product of casting, thus, the billets of *Development* are a "cast material" as the material was cast during its production. Next, the alloy is subjected to solution treatment (i.e.- solutionizing). Then the alloy is subjected to a predetermined set of routes of Equal Channel Angular Extrusion (ECAE), which corresponds to the steps of "defining ECAE routes for defining predetermined shear planes and crystallographic directions in the alloy, selecting at least a route from the defined routes for plastically deforming the alloy during ECAE and subjecting the alloy to a predetermined number of passes through the selected routes".

Regarding any additional steps present in the process of *Development*, the present claims recite a method "comprising the steps of", which is read to leave the method open to additional steps, even those which materially change the method.

Regarding claim 38, *Development* teaches (see second column of page 2) that special processing steps were studied, including annealing of the material at 250°C after four passes of ECAE, i.e.-recovery annealing, which would inherently produce a substantially uniform grain size, global microstructure and texture.

Regarding claim 39, *Development* teaches (see second column of page 2) that special processing steps were studied, including intermediate annealing at 250°C of the material after four passes of ECAE, followed by additional stages of ECAE and then subjecting the material to final annealing, i.e.-recovery annealing, at temperatures ranging from 90°C to 450°C, i.e.- at a temperature greater than the maximum temperature of the "temperature range".

Regarding claim 40, *Development* teaches (see second column of page 2) that special processing steps were studied, including intermediate annealing at 250°C of the material after four passes of ECAE, followed by additional stages of ECAE and then subjecting the material to final annealing, which is a post-extrusion processing to create a specific texture, a uniform grain size and a high texture strength for the alloy.

Regarding claim 42, *Development* teaches (see second column of page 2) subjecting the material to intermediate annealing between at least some of the passes.

Regarding claim 43, the intermediate annealing of *Development* is at 250°C (see second column of page 2), which is below the beginning stages static recrystallization, i.e.-recovery annealing.

Regarding claim 46, *Development* teaches (see second column of page 2) subjecting the material to annealing after 4 passes.

Regarding claim 47, the annealing of *Development* is at 250°C (see second column of page 2), which is below the beginning stages static recrystallization, i.e.-recovery annealing.

Regarding claim 50, the intermediate annealing of *Development* is at 250°C (see second column of page 2), which is below the beginning stages static recrystallization, i.e.-recovery annealing.

Regarding claim 51, the annealing of *Development* is at 250°C (see second column of page 2), which is below the beginning stages static recrystallization, i.e.-recovery annealing.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 44, 45, 48 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Development* in view of "Stress-Relief Heat Treating of Steel".

Development teaches, as above in paragraph no. 3, performing the intermediate and/or post-extrusion annealing as a recovery annealing, i.e.-below the beginning stages of static recrystallization, thus, failing to meet the claimed limitations.

However, "Stress-Relief Heat Treating of Steel" teaches (see page 33, 1st column) that a heat treatment is applied to workpieces that have developed residual stresses in order to relieve the stresses thereby reducing distortion and preventing stress-corrosion cracking. "Stress-Relief Heat Treating of Steel" teach (see page 33, 2nd column) that residual stresses develop during rolling, casting, forging, bending, drawing or machining. Therefore, one of ordinary skill in the art would have expected the material of *Development* to have residual stresses due to the amount of deformation caused by the ECAE. "Stress-relief treatment" and "recovery annealing" are synonyms. (Though "Stress-Relief Heat Treating of Steel" is related to a ferrous metal, the same general metallurgical principles hold true for other non-ferrous alloys, such as aluminum.) Time and temperature were known to be result effective variables (see "Stress-Relief Heat Treating of Steel" at page 33, 3rd column), therefore, it would have been obvious to one of ordinary skill in the art to have optimized these process parameters to achieve the proper relief of stresses.

Therefore, it would have been obvious to one of ordinary skill in the art to have applied the intermediate stress-relief treatment of *Development* at a higher temperature, such as at a temperature corresponding to the beginning temperature of full static recrystallization or at a temperature at or above the temperature of full static recrystallization, because the stress-relief treatment reduces stresses that cause brittle

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fracture during further cold working (for support see page 33, 1st column of "Stress-Relief Heat Treating of Steel").

6. Claims 41, 52 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Development* in view of Segal (US 5,513,512).

The teachings of *Development* are described above in paragraph no. 3.

However, *Development* does not teach a further ECAE processing step to create a specific texture, a uniform grain size and a high texture strength for the alloy.

However, because Segal teaches how to determine the final texture and grain size of the alloy when subjecting the alloy to ECAE, one of ordinary skill in the art would have expected that the process of ECAE creates the desired texture, uniform grain size and texture strength for the alloy.

Therefore, it would have been obvious to one of ordinary skill in the art that the last ECAE of *Development* would create the desired texture, uniform grain size and texture strength for the alloy as claimed.

Regarding claims 52 and 53, *Development* teaches (see second column of page 2) performing both intermediate recovery annealing and post-extrusion recovery annealing.

Response to Arguments

7. Applicant's arguments with respect to claims 37-53 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

While the *Development* reference used in the rejections above was cited in the most recent Information Disclosure Statement filed on 22 October 2003, it was previously cited in the IDS filed on 15 January 2002 (mailed 13 December 2001). Therefore, this action cannot be made final because the reference was not first cited in the most recent IDS.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D Wilkins, III whose telephone number is 703-305-9927. The examiner can normally be reached on M-Th 10:00am-8:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V King can be reached on 703-308-1146. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

hdw

Harry D Wilkins, III
Examiner
Art Unit 1742

ROY KING
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700